

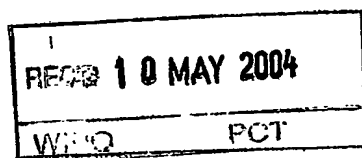


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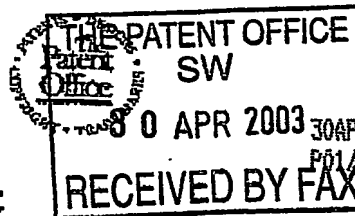
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3. Full name, address and postcode of the or of each applicant (underline all surnames)

Givaudan SA
Chemin de la Parfumerie 5
1214 Vernier
Switzerland

Patents ADP Number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

Switzerland

8408031001

4. Title of the Invention

DEVICE

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

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DUPLICATE

DEVICE

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The present invention relates to improved dispensing devices. More particularly the present invention relates to dispensing devices useful for the delivery of a volatile or evaporable material to an ambient environment, such as a room, or interior of a vehicle.

Various devices useful for the delivery of volatile materials such as fragrances, 10 odor masking agents, insecticides, medicaments as well as other volatile materials which may have a cosmetic, insecticidal or medical effect are known in the art. One particular class of such devices are those which are used for the delivery of any liquid composition which is volatile, or evaporable, to an ambient environment. Typically, such includes a reservoir or other container capable of containing an amount of such a volatile material, 15 which reservoir or other container includes a neck through which protrudes a wick. The wick operates to transport the liquid by means of capillary action from the interior of the reservoir to the ambient environment, into which it evaporates or volatilizes. Such devices are simple, and frequently effective. In certain embodiments, such devices are supplied as part of a larger apparatus, which may provide an external feature for static 20 diffusion systems or it may include a means of diffusing the volatile liquid, such as a heat source, which may surround some or part of the wick, and when heated induces more rapid volatilization of the liquid, or a fan that causes more rapid volatilization of the liquid into the ambient environment.

Such devices may be of a single-use type wherein they are provided to a 25 consumer, who discards the complete air treatment device when the supply of volatile material has been exhausted, or may be of a multi-use device wherein the consumer replaces only a refill in the air treatment device when the supply of volatile material has been exhausted. The latter permits the consumer to reuse the air treatment device, and indeed provides flexibility in its use as often various different volatile liquids may be 30 available for use, and the consumer can select among these those which are most appropriate or most favored for use.

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While such devices often effective, they are nonetheless not without shortcomings. One primary concern resides in the fact that the use of inappropriate refills in air treatment devices provide a real risk of malfunction which at one extreme may annoying to the consumer, but at the other extreme may be dangerous in certain instances. Such inappropriate refills may, for instance, be refills produced by an unauthorized supplier which may not meet the specific dimensions or the specific quality of appropriate refills which are specifically designed and produced for use in the dispensing devices. The manufacture of air treatment devices require precision in their design and assembly and when of the multi-use type, the use of appropriate refills is important to their optimal and safe performance. While the use of inappropriate refills is to be avoided due to the risk of malfunction, nonetheless consumers may inadvertently or inappropriately seek to use inappropriate refills in a multi-use type of air treatment device.

Accordingly, there is a real and urgent need in the art for improved devices useful for the delivery of volatile materials such as fragrances, odor masking agents, insecticides, medicaments as well as other volatile materials which improved devices provide a means for denying the use of inappropriate refills in an air treatment device.

In one aspect of the invention there is provided a dispensing device which includes an electrically driven actuator device for dispensing a volatile material to an ambient environment comprising:

a refill which includes a reservoir containing a volatile liquid and which further includes a closure means; and

a switch means associated with the dispensing device adapted to engage or interact with the closure means when the dispensing device is appropriately assembled.

When the closure means of the refill properly engages or interacts with the switch means of the dispensing device an electrical circuit within the dispensing device may be activated. Such an electrical circuit may control a fan, blower, heating element, piezoelectric nebulizer or any other electrically driven device, hereinafter referred to as an „actuator“ which is useful in vaporizing or dispersing a volatile liquid. If the closure means is improperly installed within the air treatment device, or if an inappropriate refill

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is installed, the electrical circuit remains open and the electrically driven device does not operate.

A still further aspect of the invention is directed to a process for preventing the use of inappropriate refills in a dispensing device, especially an air treatment device.

5 These and other aspects of the invention will become apparent from the following specification and figures.

Fig. 1 depicts a schematic view of an embodiment of the invention.

Fig. 2 depicts a schematic view of a further embodiment of the invention depicting plural switch means associated with the refill.

10 Figures 3 and 4 depict schematic views of a further embodiment of the invention in two different states.

Fig. 5 depicts a schematic view of an alternate embodiment of the invention depicting plural switch means associated with the refill.

Fig. 6 depicts a schematic view of a further embodiment of the invention.

15 Fig. 7 depicts a schematic view of a still further embodiment of the invention.

The invention provides a means for preventing the use of inappropriate refills in an air treatment device.

Fig. 1 depicts a schematic view of an embodiment of the invention. A refill 10 containing a volatile liquid which emanates therefrom (either directly, or via a porous wick) has associated therewith a closure means, here in the form of an electrically conductive strip 12 adhered to the refill 10. The strip 12 is positioned at a specific location such that when the refill 10 is properly installed in a dispensing device (represented by the rectangle „A“) the strip 12 engages switch means, here in the form of two metal contacts 14 which protrude from the housing of the dispensing device and, may be used to close an electrical circuit. In the depicted embodiment, within the electrical circuit an (optional) power on/off switch 16 may be used to interrupt the flow of current from a power source, here a battery 18, through a series of current conductors 20, usually insulated wires, through an actuator 21, which is useful in vaporizing or dispersing a volatile liquid. When the power on/off switch is in the „on“ position and the refill 10 is properly installed in the dispensing device power is supplied to the actuator

20, but if the refill 10 is improperly installed or if an inappropriate refill is installed the electrical circuit is interrupted and no electrical power is supplied to the actuator 20.

Fig. 2 depicts a schematic view of a further embodiment of the invention having plural closure means 12A, 12B associated with the refill 10. Here, each closure means 12A and 12B is a separate electrically conducting strip, each positioned at specific locations such that when the refill 10 is properly installed in an dispensing device (not shown) each of the closure means 12A, 12B separately contact separate switch means 14A and 14B. Each of the switch means 14A, 14B is in the form of two metal contacts 14 which protrude from the housing of the dispensing device and, may be used to close separate electrical circuits. The completion of one circuit allows for the operation of the actuator 20 of the dispensing device, and completion of the second circuit diverts some of the available power through a current-limiting device such as a resistor, capacitor or diode which functions to control or modify the operation of the actuator. For example, the current-limiting device may cause the emanator to operate at a different speed where the emanator is a blower or a fan, or cause the emanator to operate at different temperature where the emanator is a heating element, or cause the emanator to operate at a different operating frequency where the emanator includes a piezoelectric element. While not shown, one or both of the closure means 12A, 12B may function as the current-limiting device and be used in place of the current-limiting device 22.

The embodiments according to Figures 1 and 2 provide a simple and effective form of a closure means which is inexpensive to produce, and may be easily applied to the exterior of a refill 10. For example, a conductive metallic tape or strip, or a metallized coating on a part of the exterior refill 10 provide inexpensive closure means.

Figures 3 and 4 depict schematic views of a further embodiment of the invention in two different states. Figure 3 depicts a refill 10 which as the closure means includes a magnet 12 at a specific location such that when the refill 10 is properly installed in an dispensing device (represented by the rectangle „A“) the magnet 12 engages switch means, here in the form of a reed switch 24 which responds to the position of the magnet. When the refill 10 is at some distance away from the dispensing device, or is improperly installed with the dispensing device, or if an inappropriate refill is installed, the reed switch 24 remains open, the electrical circuit is interrupted and no electrical power is

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supplied to the actuator 20. When an appropriate refill 10 is properly installed in the dispensing device, the magnet 12 operates to close the reed switch 24 and permit closure of the electrical circuit.

Figure 5 depicts a schematic view of an alternate embodiment of the invention having plural closure means 12A, 12B in the form of magnets associated with the refill 10. Here, each closure means 12A and 12B is positioned at specific locations such that when the refill 10 is properly installed in an dispensing device (not shown) each of the closure means 12A, 12B separately cause individual switch means 14A and 14B, here in the form of reed switches, to close. As described with reference to Figure 2, the completion of one circuit allows for the operation of the actuator 20 of the dispensing device, and completion of the second circuit diverts some of the available power through a current-limiting device such as a resistor, capacitor or diode which functions to control or modify the operation of the actuator.

The embodiments according to Figures 3, 4 and 5 provide another simple and effective form of a closure means which is inexpensive to produce, and may be easily applied to the exterior of a refill 10. For example, a small magnet or a magnetic tape or strip provided to the exterior refill 10, or integrated into the construction of the refill 10 provides inexpensive closure means. Further, no exposed switch means 14 are necessary, thereby providing an improved level of safety against inadvertent electrical shock or electrical discharge, as well as potential corrosion of the switch means 14.

Figure 6 depicts a schematic view of a further embodiment of the invention, which embodiment includes a refill 10 having associated therewith a closure means in the form of an electrically conductive strip 12 adhered to the refill 10. The strip 12 is positioned at a specific location such that when the refill 10 is properly installed in an dispensing device A the strip 12 engages switch means, here two metal contacts 14 which protrude from the housing of the dispensing device A and, may be used to close an electrical circuit. The electrical circuit also includes a relay 25 which comprises an electromagnet 25A and a pair of contacts 25B. When an appropriate refill 10 is properly installed in the dispensing device thereby closing an electrical circuit, the electromagnet 25A is activated, causing contacts 25B to close and complete a second electrical circuit

which supplies power to and allows for the operation of the actuator 20 of the dispensing device.

Figure 7 depicts a schematic view of a still further embodiment of the invention where the switch means incorporates a radio frequency transmitter and receiver circuit 26 in the dispensing device A, and where the closure means incorporates a metallic coil 28. The metallic coil 28 is of appropriate construction and dimensions such that when a signal is transmitted from the radio frequency transmitter, it resonates sympathetically and emits a return resonant signal which is received by the receiver, causing the switch means to function. If no resonant signal is returned the switch means fails to function and no power is supplied to the actuator 20 of the dispensing device.

The embodiment according to Figure 7 provides another simple and effective form of a closure means and a switch means which in addition to permitting operation of the dispensing device, may also be used to provide advanced control features. For example, the embodiment would permit for the use of the dispensing device with metallic coils 28 of different dimensions, materials or configurations each of which may provide a different return resonant signal responsive to the radio frequency transmitter. The specific type of return resonant signal which is received by the receiver could be used to vary one or more of the operating characteristics of the dispensing device, particularly the operating characteristics of the actuator.

While not shown in Fig. 7, the closure means may be a radio frequency identification device, which may be preprogrammed with relevant information. In use, where the switch means incorporates a radio frequency transmitter and receiver circuit 26, the radio frequency identification device may transmit to the receiver circuit the relevant information, a portion of which may be used to activate the switch means and permit the operation of the actuator. Such radio frequency identification device may also provide further information to the receiver, e.g., manufacturer of the refill, type of volatile liquid (fragrance, odor masking agent, insecticide, medicament, or other volatile material) which further information may be used to appropriately modify the mode of operation of the actuator to ensure that it is appropriate for the type of volatile liquid.

The embodiments described in the figures are to be understood as being merely representative of the inventive teaching. It is contemplated that any form of the closure

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means and corresponding switch means could be used adapted for use in any of the other embodiments of the invention. Similarly the inventive teaching can be used in dispensing devices which include a greater number of electrical circuits. It is clearly contemplated that in addition to the actuator, further electrically operated devices such as
5 timers, motors, motion sensors, light sensors, thermocouples, as well as any other current limiting or current controlling device may be included in the dispensing devices. The use of various sources of electrical power necessary to operate the dispensing device are anticipated to include, e.g., rechargeable and non-rechargeable batteries, solar cells, automotive power supplies, as well as mains power such as is available in
10 residential/commercial buildings which may be provided directly or via a step-down type transformer.

The volatile liquid which may be used in the dispensing devices taught herein may be any volatile or evaporable material, such as fragrances, odor masking agents, insecticides, medicaments as well as other volatile materials which may have a cosmetic,
15 insecticidal or medical effect which is known to the art. Desirably the volatile liquid is one or more liquids which have a cosmetic effect such as a fragranting or odor masking effect such as may be based on one or more essential oils, or volatile liquids which have an insecticidal effect or a medical effect.

By way of non-limiting example, useful essential oils include one or more of:
20 anethole 20/21 natural, aniseed oil china star, aniseed oil globe brand, balsam (Peru), basil oil (India), black pepper oil, black pepper oleoresin 40/20, Bois de Rose (Brazil) FOB, borneol flakes (China), camphor oil, canaga oil (Java), cardamom oil, cassia oil (China), cedarwood oil (China), cinnamon bark oil, cinnamon leaf oil, citronella oil, clove bud oil, clove leaf, coriander (Russia), coumarin (China), cyclamen aldehyde,
25 diphenyl oxide, ethyl vanillin, eucalyptol, eucalyptus oil, eucalyptus citriodora, fennel oil, geranium oil, ginger oil, ginger oleoresin (India), white grapefruit oil, guaiacwood oil, gurjun balsam, heliotropin, isobornyl acetate, isolongifolene, juniper berry oil, L-methyl acetate, lavender oil, lemon oil, lemongrass oil, lime oil, litsea cubeba oil, longifolene, menthol, methyl cedryl ketone, methyl chavicol, methyl salicylate, musk ambrette, musk
30 ketone, musk xylol, nutmeg oil, orange oil, patchouli oil, peppermint oil, phenyl ethyl alcohol, pimento berry oil, pimento leaf oil, rosalin, sandalwood oil, sandenol, sage oil,

clary sage, sassafras oil, spearmint oil, spike lavender, tagetes, tea tree oil, vanilin, vetiver oil (Java), wintergreen.

These and other suitable materials which may be useful in the volatile liquid may be commercially obtained from a variety of suppliers including: Givaudan Corp. (Teaneck, NJ); Berje Inc. (Bloomfield, NJ); BBA Aroma Chemical Div. of Union Camp Corp. (Wayne, NJ); Firmenich Inc. (Plainsboro NJ); Quest International Fragrances Inc. (Mt. Olive Township, NJ); Robertet Fragrances Inc. (Oakland, NJ), or from other suppliers not necessarily listed herein.

The volatile liquids may be provided in the form of neat compositions, or may be provides as aqueous mixtures, organic mixtures or aqueous-organic mixtures which include of one or more volatile or evaporable materials.

The dispensing device according to the invention may be used to dispense a volatile liquid in any ambient environment. Non-limiting examples of ambient environments include interior spaces of buildings or other structures such as rooms, hallways, elevators, common areas, closets, as well as the interior spaces of vehicles such as automobile interiors, boat interiors, aircraft cabins, and the like. The most preferred embodiments of the invention are air treatment devices.

While the invention is susceptible of various modifications and alternative forms, it is to be understood that specific embodiments thereof have been shown by way of example in the drawings which are not intended to limit the invention to the particular forms disclosed; on the contrary the intention is to cover all modifications, equivalents and alternatives falling within the scope and spirit of the invention as expressed in the appended claims.

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Claims:

1. A dispensing device which includes an electrically driven actuator device for dispensing a volatile material to an ambient environment comprising:
 - 5 a refill which includes a reservoir containing a volatile liquid and which further includes a closure means; and
 - a switch means associated with the dispensing device adapted to engage or interact with the closure means when the dispensing device is appropriately assembled.
- 10 2. A dispensing device according to claim 1 wherein the actuator device is a fan, blower, heating element, piezoelectric nebulizer or other electrically driven device useful in vaporizing or dispersing a volatile liquid.
3. A dispensing device according to claim 1 which comprises a plurality of closure
15 means and a plurality of switch means.
4. A dispensing device according to any preceeding claim wherein the closure means is an electrically conductive strip or a magnet.
- 20 5. A dispensing device according to any of claims 1- 3 wherein the switch means incorporates a radio frequency transmitter and receiver circuit.
6. A dispensing device according to any of claims 1 - 3 wherein the closure means incorporates a metallic coil which resonates and emits a return resonant signal.
25
7. A dispensing device according to any preceeding claim substantially as described with reference to the Figures.
8. A process for preventing the use of inappropriate refills in an air treatment device
30 which contemplates the step of:

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providing a dispensing device according to any preceeding claim to an ambient environment.

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Abstract:

The invention provides a dispensing device which includes an electrically driven actuator device for dispensing a volatile material to an ambient environment comprising: a refill which includes a reservoir containing a volatile liquid and which further includes a closure means; and a switch means associated with the dispensing device adapted to engage or interact with the closure means when the dispensing device is appropriately assembled. When the closure means of the refill properly engages or interacts with the switch means of the the dispensing device an electrical circuit within the dispensing device may be activated. Such an electrical circuit may control a fan, blower, heating element, piezoelectric nebulizer or any other electrically driven device which is useful in vaporizing or dispersing a volatile liquid. If he closure means in improperly installed within the air treatment device, or if an inappropriate refill is installed, the electrical circuit remains open and the electrically driven device does not operate.

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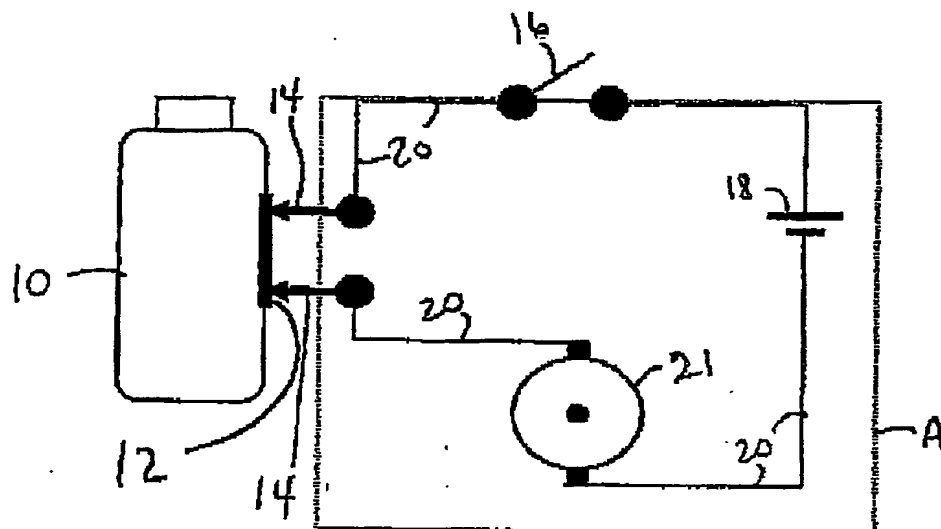


Figure 1

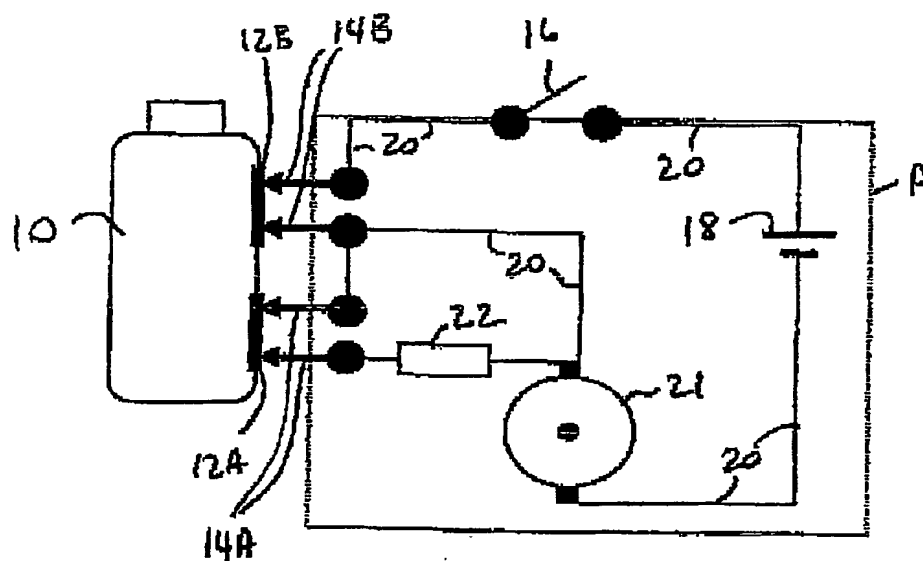


Figure 2

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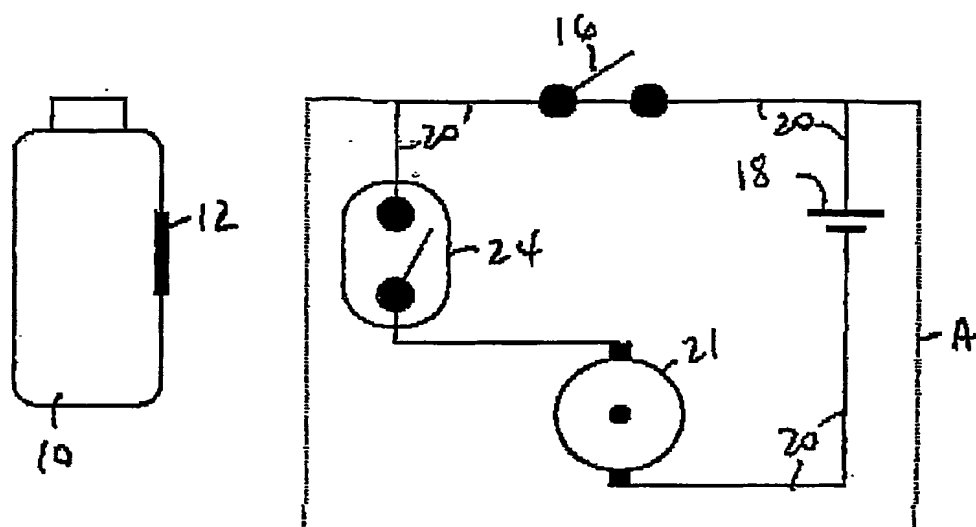


Figure 3

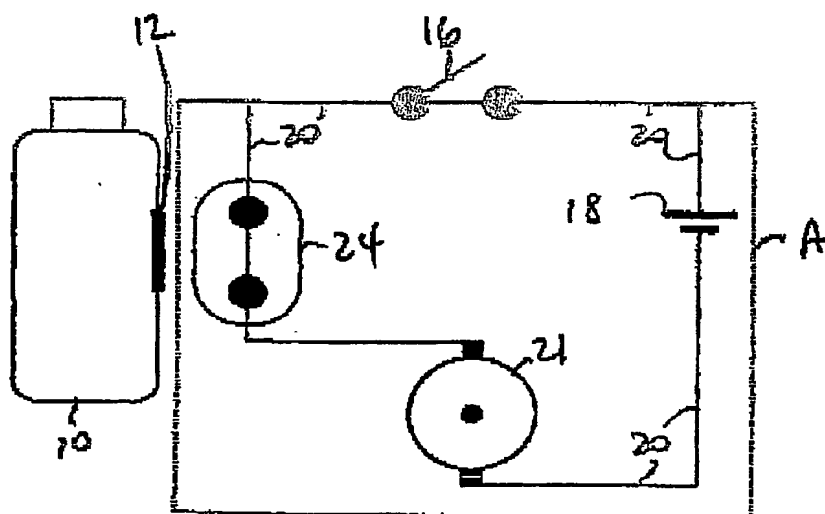


Figure 4

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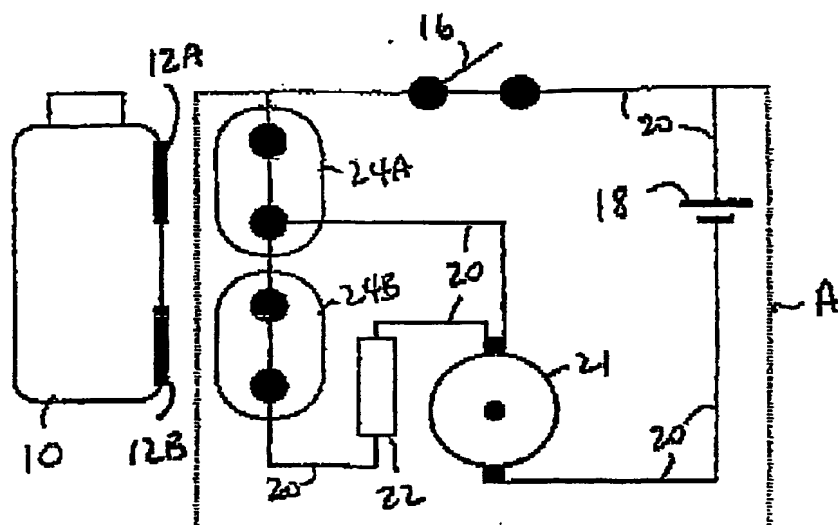


Figure 5

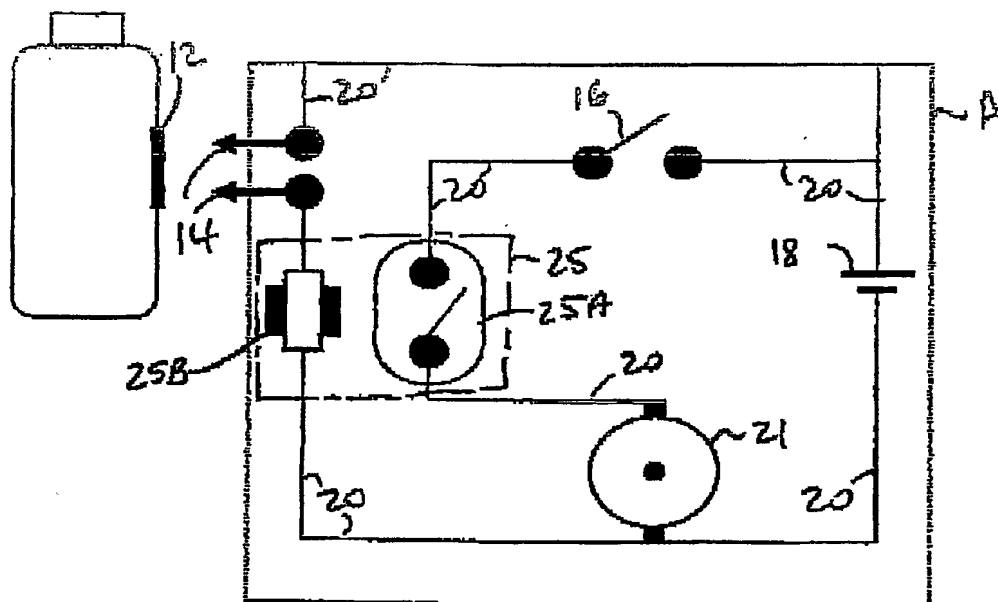


Figure 6

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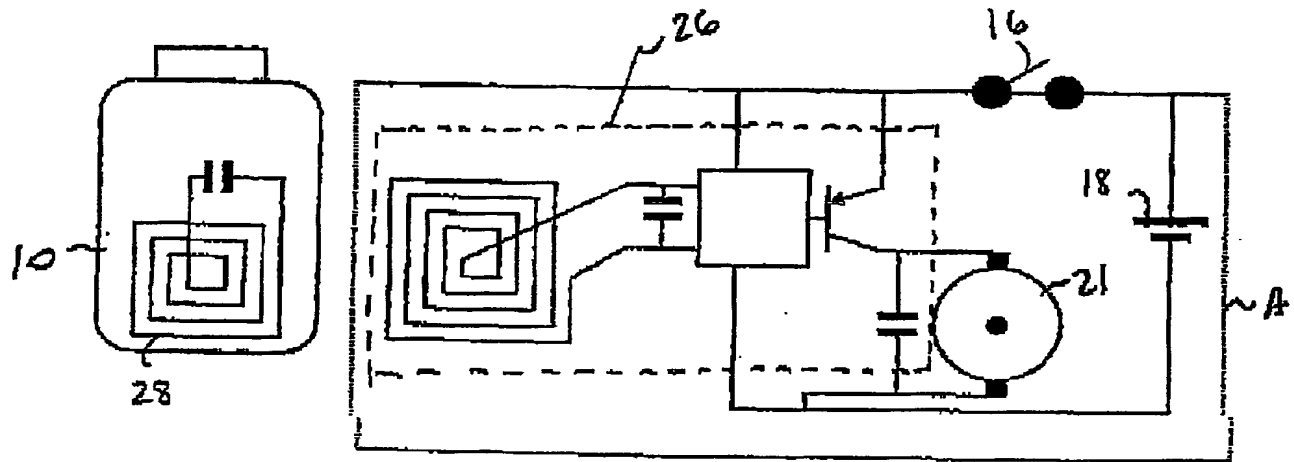


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